SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Titanium Mountain

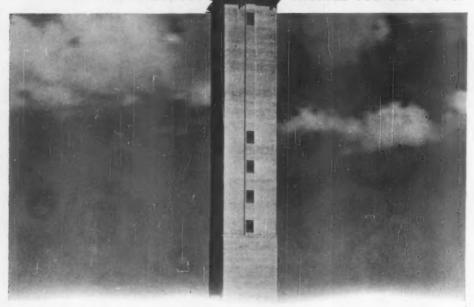
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A SCIENCE SERVICE PUBLICATION



FOR TV...IT DODGES

TROUBLE YOU CAN'T STOP



Radio Relay station on route between Chicago, Ill., and Des Moines, Iowa. Every fifth or sixth relaying tower is a control station, where high-speed switching equipment enables a TV picture to skip out of a troubled channel and into a stand-by protection channel faster than the eye can wink.

There's no way to stop atmospheric changes that threaten television with "fade." But, for TV that travels over Bell's Radio Relay System, Bell Laboratories engineers have devised a way to sidestep Nature's interference.

When a fade threatens—usually before the viewer is aware—an electronic watchman sends a warning signal back by wire to a control station perhaps 200 miles away. An automatic switching mechanism promptly transfers the picture to a clear channel. The entire

operation takes 1/500 of a second. When the fade ends, the picture is switched back to the original channel.

This is an important addition to the automatic alarm and maintenance system that guards Bell's Long Distance network for television and telephone calls. It marks a new advance in Bell Telephone Laboratories' microwave art, developed to make your Long Distance telephone service, and your TV pictures, better each year.

BELL TELEPHONE LABORATORIES



Improving telephone service for America provides careers for creative men in scientific and technical fields.

PUBLIC HEALTH

Triggers for Catching Cold

Tests upon thousands of volunteers to show whether grandma was right when she warned you could catch cold by sitting in drafts or by getting wet feet.

GRANDMA SEEMS to have been right. You may be able to catch cold by getting your feet wet and sitting in a draft.

In an investigation that involves tests upon thousands of volunteer human "guinea-pigs," Dr. Winston Harvey Price, 31-year-old biochemist of the Johns Hopkins School of Hygiene and Public Health, Baltimore, is making a new approach to disease fighting that promises better prevention and treatment of such virus ills as 'flu, typhus and colds.

The \$1,000 Theobald Smith award, a top annual prize in medicine, was presented to Dr. Price by the Eli Lilly and Co., Indianapolis, at the meeting of the American Association for the Advancement of Science in

Berkeley, Calif.

Dr. Price hopes to put grandma's idea on sound scientific footing by discovering the mechanism through which wet feet start a cold in the head, or an attack of influenza.

His studies of another sickness, typhus fever, show that germs may lurk in the body for years without causing trouble. Then something reactivates them and disease sets in.

The 'flu virus and other viruses such as those that cause colds or common-cold-like ailments may lurk in human lungs, noses and throats without causing any symptoms until something comes along to activate the viruses, Dr. Price thinks. That something may be wet feet or cold drafts.

More than 150 different viruses have recently been isolated from human noses and throats by other scientists. The persons harboring these viruses were many of them quite well, but some did have common cold

In the case of typhus fever, the germs, called rickettsia, can be reactivated in laboratory animals by doses of ACTH and cortisone acetate, Dr. Price discovered.

Human beings also may harbor typhus fever germs in their bodies for long periods after having the disease. Then when something reactivates the germs, they get sick with what is called Brill's disease.

Dr. Price tried his ideas on human "guinea-pigs." A group of 28 human volunteers who had typhus in Russia, Poland or Lithuania 20 years or more ago before coming to this country is now cooperating

in his studies.

They let him give them ACTH and cortisone acetate, as he gave it to the laboratory animals, to see whether this would reactivate the typhus germs. The two hormone drugs did not have this effect in the human

However, from these experiments, Dr. Price learned something new and more important about antibodies. This finding may change our ideas about vaccines in some

Antibodies are the substances formed in the body to fight off invading disease germs. They usually are quite specific, a different kind of antibody being formed for each different kind of disease germ.

After a person has had a germ-caused sickness, his blood will have antibodies to this disease for a long time, if not for life. Vaccines give protection by stimulating antibody production, though without caus-

Some volunteers who got ACTH to see whether it would reactivate typhus fever germs in their bodies did not come down with typhus, but the antibodies in their blood disappeared. After about three months, they began slowly to appear again.

This, Dr. Price thinks, means that having antibodies circulating in their blood is not the sole reason why people who have had typhus fever or anti-typhus vaccine are immune to the disease. The antibodies are important, but there must be another more important mechanism for disease protection.

It may be the breakdown of this mechanism that lets you "catch cold" when you have been sitting in a draft or getting wet

Dr. Price and associates now have under way a big investigation involving about 1,000 volunteers among medical students, graduate nurses, student nurses and undergraduate students of Johns Hopkins University. In April, the investigation will be expanded to include another 1,000 living on an isolated island in the Chesapeake Bay.

These 2,000 human guinea pigs will be followed every two weeks throughout the year, some for as long as five years, Dr.

Price hopes.

To Science Service, Dr. Price expressed primary interest in:

1. What causes an epidemic of a respiratory disease agent, whether it be the common cold, influenza, atypical pneumonia or one of the ARD or APC viruses?

2. Where is the virus between epidemics? 3. What determines resistance and susceptibility to these agents? Dr. Price already has evidence, at least in some instances, that it is not circulating antibodies.

"Circulating antibodies are certainly of very great importance," Dr. Price said. "However, they are by no means the whole story in resistance. Certainly there are one or more unknown factors which also play a role in whether a person will be resistant or susceptible."

In most investigations, Dr. Price pointed

out, research people wait until there is an epidemic. Then they isolate the agent and study it. He feels that in order to understand how epidemics come one must study the agent both in epidemics and in interepidemic periods.

Dr. Price also wishes to find out whether activation of latent respiratory agents does play a role in the natural history of the

infective agent.

For example, someone might have influenza and harbor the agent in his lungs for six months or so and, then, under certain stimulus, the agent would become activated and that would begin the epidemic.

Experiments with laboratory animals are being started to discover what is the activating agent. Dr. Price wants to know what actually happens if you get your feet wet and then come down with influenza. Is it the release of some hormone? Or what?

If we could find out, we might do something about it other than wearing over-

shoes in wet weather.

Other investigators have not been able to show that wet feet or cold reduces resistance to influenza or other respiratory diseases. There has been little work on a laboratory

Dr. Price is also continuing his investigations of arthropod-borne disease germs, such as the tick-borne Rocky Mountain spotted fever rickettsia, and the louse- and fleaborne typhus fever viruses.

He is trying to find whether a lysogenic arthropod-borne virus exists. If so, it would be the reservoir for viruses betwen epidemics. A lysogenic virus is one which is tied to its host cell very closely.

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DR. PAUL B. SEARS-New president-elect of the American Association for the Advancement of Science, Dr. Sears is a professor of botany at Yale University. Dr. Sears, a Science Service trustee, is noted for bis studies on vegetation and climatic bistory based on the analysis of pollen, and for bis work in conservation.

PSYCHOLOGY

Watch Attempted Suicides

➤ OF THE 20,000 or more suicides in the United States each year, three-fourths followed previous threats of or attempts at suicide. Two Los Angeles Veterans Administration psychologists, Drs. Edwin S. Shneidman and Norman L. Farberow, reported these figures to the meeting of the American Association for the Advancement of Science in Berkeley, Calif.

Their findings emphasize the importance of suicidal behavior, attempted or threatened. It should be taken "very seriously," the psychologists said, pointing out that the next suicidal "gesture" may be the

final one.

The 90 days after a depressed or emotionally disturbed patient seems to be recovering comprise the period when greatest watchfulness and guard are needed. Almost half the persons who commit suicide do so within three months of having passed an emotional crisis and, seemingly, being on their way to recovery, they found.

Their figures are based on studies of case histories, psychological tests and suicide notes from persons who have committed suicide and those who have not.

The data, covering the years from 1944 to 1954, have been gathered from the files of the Los Angeles County coroner's office and from a local Veterans Administration hospital and clinic.

The "control" data, with which the case histories and psychological tests for the

people who committed suicide are being compared, were obtained from three other matched groups: people who had attempted suicide, people who threatened suicide, and people who were non-suicidal, that is, in whom there were no suicidal tendencies.

The psychologists have collected 721 genuine suicide notes written by people of both sexes and ranging in age from 13 to 96. These have been compared with simulated suicide notes written by matching nonsuicidal men and women who wrote what they imagined they would have written if they had been about to take their own lives.

The chief difference is that the person about to take his own life includes orders and admonitions as though he had reached a final decision in solving his problems and had accepted the fact that he will soon no longer be around. Apparently only the genuine suicide note writer can imagine his "really being gone."

The psychological tests showed that people who threaten suicide seem more emotionally disturbed than those who attempt suicide, but both must be taken seriously and watched carefully for at least three months, the psychologists caution.

"The importance of calling upon professional psychiatric, psychological, and social service specialists for the proper over-all treatment of a potentially suicidal person cannot be over-emphasized," they said.

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sheath may be left in the wound. Occasionally, the sting may break off in it.

"When a patient states that he stepped upon a 'slimy thing' in the surf and received a painful wound it does not necessarily follow that he was stung by a stingray," Dr. Russell said.

"Stingings by broken beer bottles, cans and bivalves constitute an important entity along certain of our American coasts. The syndrome is well known to the lifeguard services. Occasionally, one reads in a popular magazine of a swimmer being stung by a manta ray. These wounds can be effectively treated with placebos (pretend medicine); manta rays do not have stings."

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MEDICINE

Heat Inactivates Venom

> RULES FOR treating stingray injuries, based on the discovery that heat inactivates the poison of this fish, were presented at the first International Conference on Animal Venoms held with the American Association for the Advancement of Science meeting in Berkeley, Calif.

The rules were given by Dr. Findlay E. Russell of Huntington Memorial Hospital,

Pasadena, Calif., as follows:

1. Irrigate the wound thoroughly with the cold salt water at hand.

2. Immerse the involved extremity in hot water for 30 minutes to an hour.

3. Apply an antiseptic dressing and consult a physician for further treatment if needed.

More than a score of substances, from adrenalin to wine, including macerated cockroaches, tobacco juice and urine, have been used to treat stingray injuries, Dr. Russell stated. Studies with human volunteers who let the stingray's venom be injected into them showed the ineffectiveness of the various substances.

Stingrays, he explained, inflict their injuries by means of a dentinal sting that is located on the back surface of the animal's

The sting, or caudal spine, is bilaterally serrated with the sharp teeth curved toward the head. These serrations are re-sponsible for the lacerating effect of the spine as it is withdrawn from the victim's

The location, size and number of spines are determined by the species, habitat and age of the fish. Some species have stings of less than a quarter of an inch in length, while in others the spine may reach in excess of 11 inches. The venom is contained within the tissues of the ventrolateral grooves of the spine.

Stingray injuries usually occur when the unwary victim treads upon the animal while wading in the ocean surf or mud flats of a bay, slough or river. The weight of one's foot on the back of these fish provides sufficient stimulation for the animal to thrust his tail upward and forward, driving his sting into the foot or leg of the victim.

As the sting enters the flesh, the integumentary sheath is ruptured and the pressure exerted by the involved tissues is sufficient to express the venom from the toxin-laden cells and their supporting structures. In withdrawing the spine, the integumentary

World Starvation Eased

> ONE OF the major worries of the world, whether the earth will become so filled with people much of humanity will starve to death, is taking care of itself, facts presented at the American Association for the Advancement of Science meeting in Berkeley, Calif., seem to indicate.

As civilizations became more industrialized in the Western countries, their birth rates declined, so much so that there was

a race suicide scare.

Simultaneously, better health and increased food gave the so-called underdeveloped countries a population spurt, thus creating a fear that the people in the leastdeveloped countries might take over the world.

This unequal population growth "unleashed by the splendid success of our civilization in preserving human life" will continue in all major regions through 1980, but Dr. Dudley Kirk of the Population Council, New York, reported that Asia and Latin America may be expected eventually to slow their momentum of population growth.

The choice between balance of births and deaths and periodic population reduction through famine, epidemics and war will be made in the next two or three generations by action of individuals and not by governmental policies.

Both Soviet Russia and Japan have checked birth rates that were causing concern to other nations. The present Soviet birth rate of 24 per 1,000 population, slightly less than in the United States, is a drop from the prewar figure of 38 per thousand.

The Japanese rate is 21.5, below that of the United States and rapidly approaching

European levels.

Atomic war might wipe out enough people to influence population, but Dr. Kirk pointed out that only about five percent of world population lives in the 60 cities of more than 1,000,000 population that would be prime atomic targets.

The destruction of all our major cities would not directly destroy a large part of

the human race, he said.

In considering human survival, Dr. Kirk computes that four or five normal years of world population growth would completely replace numerically the United States population, and six years would replace that of the Soviet Union.

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EDUCATION

Urge "Genius Specialists"

▶ AMERICAN SCHOOL systems should recruit outstanding teachers to be specialists with superior students, especially those talented in science and mathematics, Dr. Garford G. Gordon of the California Teachers Association urged at the American Association for the Advancement of Science meeting in Berkeley, Calif.

When such properly trained and equipped "genius specialists" are available, they should be given the backing of the school

administration.

The specialist teacher should, however, be allowed a free hand in dealing with her geniuses, whether by "needling" them to use their talents to a fuller extent or by giving the superior students a free hand to follow their own hunches.

A survey of what American high schools are doing to encourage superior science and mathematics students, and so help to relieve the national shortage of technological manpower, and a study of Science Talent Search results, convinced Dr. Gordon that the schools are not doing badly.

Some schools, however, are not doing what they could. Community pressure, Dr. Gordon pointed out, is often put on the schools to take special care of slow students and juvenile delinquents. In such a situation, school administrators must neglect the brilliant unless they happen to be brilliantly delinquent.

More money must be spent to provide for

the schooling of superior science and mathematics students, Dr. Gordon concludes. But more than for money, the need is for smaller classes, lighter teacher loads, more freedom from administrative restrictions on teachers of superior students, more time for teachers and students, and better prepared

A recent California Teachers Association study found that the percentage of high school classes taught by inadequately trained teachers was higher for mathematics than for any other academic subject.

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ASTRONOMY

Spot New Object In Southern Sky

AN OBJECT moving at about the rate of an asteroid, but not definitely identified as such, has been discovered in the constellation of Taurus, the bull, which is visible high in the southern sky.

The object's magnitude is 16, too faint to be seen without a very large telescope. It was spotted on Dec. 18, 1954, by Guillermo Haro and Enrique Chavira of the Observatorio Astrofisico Nacional, Tonanzintla, Puebla, Mexico. News of its discovcry was sent to observatories by Harvard College Observatory.

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· RADIO

Saturday, Jan. 15, 1955, 5:00-5:15 p.m. EST "Adventures in Science," with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station. Dr. John B. Schmitt, associate professor of entomology, Rutgers, State University of New Jersey at New Brunswick, will discuss "Termites."

PUBLIC HEALTH

Wild Rodents Cleared Of Valley Fever Blame

CONTRARY TO previous belief, wild rodents are not an important reservoir for organisms that cause valley fever, or coccidioidomycosis, a respiratory disease found in the Southwest.

This was concluded by Dr. Orda Plunkett. Robert Lubarsky and Frank Swatek of the department of botany at the University of California at Los Angeles from a study of more than 1,100 wild rats, mice and rabbits trapped in various southern California areas.

Only eight of the animals, 0.7 of one percent, yielded evidence of infection with

the valley fever organism.

With such a small percentage of the large collection showing evidence of infection, the investigators concluded that these rodents are not a dangerous source of infection.

The eight animals were probably accidentally infected from soils containing the organism, the researchers believe.

The infected group consisted of pocket mice, kangaroo rats and one jack rabbit. This is the first time the rabbit has been found to be susceptible to the disease.

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MARINE BIOLOGY

Shrimp-Like Animals Live Beneath Arctic Ice

➤ WHILE MAN tries to find a way to live on the surface of the barren sea-ice covering much of the central Arctic Ocean, two species of shrimp-like animals manage very well living just beneath the ice.

The survival habits of marine organisms known as amphipods were reported by Dr. J. Laurens Barnard of the Arctic Aeromedical Laboratory and University of Southern California at the American Association for the Advancement of Science meeting in Berkeley, Calif.

During the wintertime, Dr. Barnard reported, these amphipods are found in great numbers near the surface of the ocean in a layer less than 30 feet deep, below the seven-foot-thick ice layer that year-round covers this area near the North Pole.

One of the two species, Gammarus wilkitzkii, the scientist stated, has made an interesting adjustment to this environment. Normally, amphipods live only on the ocean bottom in depths up to 300 feet. This one, however, stays alive by clinging to the undersurface of the ice itself.

BIOLOGY

Photosynthesis Achieved

Team of University of California scientists has discovered the complete process of photosynthesis, the American Association for the Advancement of Science meeting was told.

➤ DISCOVERY OF the complete process of photosynthesis, explaining how the green plant makes food out of the energy of the sunlight and air, water and chemicals, has been achieved and reported to the American Association for the Advancement of Science meeting in Berkeley, Calif.

This should mean the eventual production of chemically pure foods, like sugar and starches, by means of factories that ape or improve upon the green leaf.

A team of University of California scientists, headed by Dr. Daniel I. Arnon, has achieved this important step after six years of research. The scientists used also dozens of other painstaking discoveries made in other laboratories.

The whole process of photosynthesis takes place within the small particles in plant tissue that contain the green pigment called chlorophyll. These chloroplasts, as they are called, are the plant's food factories. The manufacturing process takes three steps:

1. The energy of sunlight is used to break down the water into hydrogen and oxygen. Part of oxygen goes off into the air. Part is used to build vitamins and a phosphate, adenosine triphosphate, called ATP, which are needed in the process.

2. Inorganic phosphate is changed to this ATP without need of atmospheric oxygen. This phosphorylation needs three vitamins made within the chloroplast, riboflavin or B-2. vitamin K and vitamin C.

3. With the aid of ATP and hydrogen, carbon is captured, some given off as carbon dioxide and some used in the starch, fruc-

tose sugar and other chemicals that photosynthesis produces.

This may seem complex, but it is one of the most important processes in the world and, until now, its details have been a major mystery.

When the University of California group was able to isolate the little green particles from spinach and make them function outside the living plant, the way opened to the solution of photosynthesis.

Dr. Arnon foresees the possibility of synthetic food production by a non-living photosynthesis, but he does not expect that it will ruin agriculture. Bulk foods and chemicals of high energy, like sugar, but that have no flavor, would probably be the first produced when artificial photosynthesis arrives.

Science stands, he believes, on the threshold of a practical and detailed mechanization of the necessary steps in such food production. Even more important, man is no longer overawed by the complexity of the living cell, for he has synthesized photosynthesis, just as he has made many chemicals that were once thought to be the monopoly of nature.

Drs. F. R. Whatley and M. B. Allen were Dr. Arnon's associates, assisted by John Capindale and Lois Durham, graduate students.

Once fermentation was thought to be a process that could only occur in living matter, but the enzymes were discovered, now what was done for fermentation processes. Now what was done for fermentation has been done for photosynthesis.

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DENDROLOGY

Tree Rings for Dating

TREE RINGS can date the exact year of landslides, glaciers and volcanic eruptions, Dr. Donald B. Lawrence, professor of botany at the University of Minnesota, reported to the American Association for the Advancement of Science meeting in Berkeley, Calif.

On June 23, 1925, Dr. Lawrence stated, 50,000,000 cubic yards of the north face of Sheep Mountain in Wyoming slid into the valley and across the Gros Ventre River, forming a dam 180 feet high and a mile and a half wide. A study of the firs, spruces, pines and aspens that fell with the slide and continued to grow, some in erect and others in tilted positions, showed that each had clearly marked the violent change in its ring pattern.

A second study of scarred and tilted trees still growing on Mt. Hood in Oregon similarly showed the exact year in which a glacial advance during the "Little Ice Age" of the 18th century made its maximum advance, the Minnesota botanist reported.

In a third study, made of the trees on Mt. St. Helens in southwestern Washington, one of the youngest volcanic peaks in North America, Dr. Lawrence stated that tree ring dating pinpointed a history of the various volcanic eruptions during the past five centuries.

As an example, tree ring dating recorded a violent eruption as having occurred on Mt. St. Helens within a few years of 1802 A.D.

Dr. Lawrence stated that tree ring dating

has shown that important natural changes in the earth's features have occurred in the Rocky Mountains and in the Cascade Range within the lifetimes of ordinary forest trees living today.

Tree ring studies have heretofore been most commonly used to date prehistoric ruins and to work out changes in precipitation and temperature, and fluctuations in lake levels.

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EDUCATION

"Question" Is Most Misspelled Word

THE WORD "question" is misspelled by elementary school children in more ways than any other word.

There are 152 different ways to misspell this common word, but the most often used are "qustion" by the younger children and "quistion" by the older ones. "Question" also leads in the total number of misspellings with 276.

This record for "question" was reported to the American Association for the Advancement of Science meeting in Berkeley, Calif., by Dr. George C. Kyte of the University of California.

His analysis of most common misspellings will aid the teacher in anticipating students' errors and by showing what to stress in teaching to prevent or eliminate the errors.

One group of common errors results from leaving out a silent letter, for example. Such misspellings include: Befor, carful, maks, mor, tabl and trad. In another group, a consonant is erroneously doubled. These include: allmost, allready, carefull and hopping (for hoping).

Some mistakes are directly due to faulty pronunciation, such as wile, pertty, famly and suprise.

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MEDICINE

47 Anti-Bite and Sting Remedies Available

➤ FOR TREATMENT of snake bites, spider bites and scorpion stings in all parts of the world, there are 47 different preparations. These include 36 products for treating snake bite, six for scorpion sting and five for spider bite.

Names, descriptions and uses of these were presented by Capt. Hugh L. Keegan of the Army Medical Service Graduate School at the first International Conference on Animal Venoms held in Berkeley, Calif., with the meeting of the American Association for the Advancement of Science.

All but one of the antivenins listed consist of serum from immunized horses. Consequently, Capt. Keegan warned, the doctor should find out before giving one of these whether the bite or sting victim is sensitive to horse serum.



RECORD-SHATTERING RIDE—Lt. Col. John P. Stapp of the U. S. Air Force is strapped into the sled in which he reached the new world ground speed record of 632 miles an hour, then was jolted to a dead stop in 1.4 seconds. The purpose of the run, made at Holloman Air Development Center, New Mexico, was to explore human tolerances during a high speed bailout from jet planes. The sled, propelled by nine rockets, was stopped by water brakes that subjected him to an average force 27 times greater than gravity for a little more than a second. He withstood wind forces of more than two tons, but suffered no ill effects except two black eyes, caused by his eyeballs being thrown against the eyelids during the stop, and small blisters on his skin from dust particles in the air.

PHYSIOLOGY

Pilot's Eyes Displaced

PILOTS AND crew members of jet and rocket ships will have trouble reading fuel gages, airspeed indicators and compasses when their aircraft changes direction abruptly at high speeds, even if they are wearing conventional anti-blackout suits and take the prone, supine and semi-supine positions intended to protect them.

The reason is that the lenses of the eyes are pulled out of place by the force of gravity as this increases.

Studies showing that increased g forces reduce visual acuity, and the displaced lens theory to explain it were reported by William J. White of the Aero Medical Laboratory, Wright-Patterson Air Force Base, Ohio, at the meeting of the American Association for the Advancement of Science in Berkeley, Calif.

The experiments leading to the findings were made by Mr. White and Lt. Warren R. Jorve. Further protective devices must be designed if the human operator is to take full advantage of the aircraft's maneuverable potentialities, Mr. White said.

The experiments are part of a continuing search to determine all the effects on pilot and crew members of the high performance jet and rocket propelled aircraft. Engineering advances made it possible for the aircraft to withstand tremendous structural strains over long periods of time, but man still has the same body, the efficiency of which is affected by blood circulation, vision and consciousness, Mr. White said.

Effects of acceleration are apparent as weight. One g equals a man's weight, two g doubles it, three g triples it, etc. In conducting experiments in g forces, Aero Medical Laboratory personnel use a centrifuge that looks like a cab mounted on a rotating arm, much like a merry-goround. Visual acuity was measured with the checkerboard targets that are standard with the Ortho-Rater.

Mr. White and Lt. Jorve reject the theory that the reduction they observed in visual acuity was due to reduction in blood supply to the head region of the body.

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ANTHROPOLOGY

Man and Monkeys Differ More Than Was Thought

MAN IS less closely related to monkeys on the evolutionary family tree than scientists have supposed, Dr. Sherwood L. Washburn, University of Chicago anthropologist, told the meeting of the American Anthropological Association in Detroit, Mich.

The error has been due to wrong counting of the bones in the spine.

In the past, Dr. Washburn said, it has been generally assumed that there was a continuity of the evolutionary pattern between all three groups (monkeys, apes and men) because of a similar distribution of spinal vertebrae.

Scientists counted in man 12 vertebrae attached to the ribs and five in the lower back. The count for apes and monkeys was practically the same, with 12 rib vertebrae and seven in the lower back.

However, this count was wrong, Dr. Washburn said. In the case of the monkeys, the two lower rib vertebrae should be counted with the lumbar, or lower back vertebrae, making the count ten and nine instead of 12 and seven.

The reason why these two lower rib vertebrae should be counted with the lumbar vertebrae in the monkey is that they serve an entirely different function in monkeys from what they do in man or in the great apes.

In monkeys, the lumbar vertebrae and the two vertebrae formerly counted as rib vertebrae are large and extremely wellmuscled. In apes and man, the lower vertebrae are relatively small and not at all heavily muscled.

The difference is due to the fact that monkeys run on all fours while apes and men walk erect.

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OCEANOGRAPHY

Northeast Pacific Ocean Was Colder Century Ago

TAKING A dip in the Gulf of Alaska or the northeast Pacific Ocean 100 years ago was a colder proposition than it is today.

This and other aspects of the sea temperature for this area were described at the meeting of the American Association for the Advancement of Science in Berkeley, Calif., by Margaret K. Robinson of the Scripps Institution of Oceanography, La Jolla, Calif.

Reporting the results of an analysis of 16,103 observations made between 1941 and 1952 with a bathythermograph (BT), an instrument that measures temperature against depth, Miss Robinson stated that 19th century observations showed that the average temperature was lower.

The observations for the 19th century, numbering 707, were taken in 16 years between 1816 and 1889.

MEDICINE

Cite Ten Major Gains In Fight on Cancer

THE FOLLOWING ten major gains in the fight on cancer during the past two years are cited in the 1952 to 1954 biennial report of Memorial Center for Cancer and Allied Diseases with its research unit, the Sloan-Kettering Institute, New York:

1. The mass and sustained growth, for the first time, of human cancers in labora-

tory animals.

2. An improvement from six percent to 39.5 percent in cure rates for soft tissue sarcomas over the past 20 years.

3. The synthesis by the Wellcome Research Laboratories of 6-mercaptopurine, a chemical that appears from tests at Memorial to be one of the most effective in restraining acute leukemia.

4. An increase through the years from 10% to 75% in the number of patients with cancer of the stomach who can be treated

surgically.

5. The establishment of circumcision of male infants as a practical means for partial prevention of cervical cancer in women.

6. Improvement in techniques of surgery of the liver permitting removal of cancer in this vital organ in some selected cases.

7. The development of effective treatment.

7. The development of effective treatment for formerly uncontrollable small blood vessel tumors (hemorrhagic telangiectasia).

8. The adaptation of a virus to destroy, rapidly and completely, human cancer cells of one type in the test tube.

9. The definition of two types of breast cancer, requiring different treatment.

10. The discovery that cortisone as well as sex hormones will temporarily control some advanced breast cancer.

Science News Letter, January 8, 1955

BIOCHEMISTRY

Find Chemicals Help In Causing Cancer

DISCOVERY OF a new group of chemicals that help to cause skin cancer in mice, although they do not cause it by themselves, is announced by Drs. Kai Setala, Heikki Setala and Paul Holsti of the University of Helsinki, Finland, in Science (Dec. 24).

The chemicals are synthetics, including some detergents and carbowaxes. They got into the cancer picture because they were being used as "vehicles" for known cancercausing chemicals being applied to the skin

of mice.

During the studies, the scientists found that some of these chemicals delayed the development of cancers while others greatly enhanced cancer development. Some caused different types of changes in skin structure.

Some of these changes "astonishingly closely resemble" those described as the early response of the mouse skin to cancercausing chemicals, the scientists state.

They believe from this finding that the early response changes to cancer-causers

reported by other scientists are for the most part non-specific phenomena running parallel to the "still unknown process" of cancer production, or are merely a reflection of cancer production.

The mechanism of the physicochemical and structural changes in the skin is now being studied with special attention to the property of the nonpolar-polar co-cancercausing chemicals to change and degenerate various proteins as well as to bind water, which seems to be one of the features of the induced change.

Science News Letter, January 8, 1955

PSYCHOLOGY

Planning Requires Eight Different Abilities

➤ EIGHT DIFFERENT human abilities go to build up a talent for planning, a team of psychologists from the Apitudes Research Projects of the University of Southern California told the meeting of the American Association for the Advancement of Science in Berkeley, Calif.

of Science in Berkeley, Calif.

The eight abilities were spotted as a result of giving 50 especially designed tests to nearly 400 Air Force aircrew trainees.

The abilities are:

1. Ordering—the ability to arrange objects or events in a series that is chronologically or logically meaningful.

Elaboration—the ability to round out
 a plan by supplying many details.
 Perceptual foresight — the ability to

trace one's way through a maze-like pattern.
4. Conceptual foresight—the ability to anticipate needs or consequences in a given

problem situation.

5. Ability to see relationships.

6. Originality.

Fluency of ideas.
 Judgment.

The psychologists reporting this research were Raymond M. Berger, Dr. J. P. Guilford and Paul R. Christensen.

Science News Letter, January 8, 1955

STATISTICS

Lowest Death Rate, Most Babies in 1954

A RECORD number of new Americans, 4,000,000 of them, arrived in 1954. Along with this bumper baby crop, the year set another record: the lowest death rate in the nation's history.

These figures were announced by Dr. Leonard A. Scheele, Surgeon General of the Public Health Service of the U.S. Department of Health, Education, and Welfare, on the basis of vital statistics reports for the first 10 months of the year.

The marriage rate declined to 9.2 per 1,000 population. Low birth rates in the depression 1930's are responsible.

Divorces were also on the decline, according to the figures for the first nine months of 1954. Since the 1946 peak, these rates have dropped over 40%.

Science News Letter, January 8, 1955



HERPETOLOGY

Tortoise, Gift in 1777, Still Lives in Palace

➤ A GIANT tortoise that Capt. James Cook presented to the king of Tongatabu, principal island of the Tonga group, in 1777 is still a household pet of the royal family.

Crown Prince Tugi, premier of the Pacific monarchy and heir to the throne of Queen Salote, recently visited the Bishop Museum in Honolulu, T. H., to inquire how to preserve the tortoise when it dies. Prince Tugi says the pet is still very much alive and strolls around in the same compound built for him 177 years ago, but that he cannot be expected to live forever.

The tortoise is called King of Malila, after the ruler to whom he was presented

by Capt. Cook.

The director of the Museum, Dr. Alexander Spochr, has written to mainland experts to find out how the preserving job should be done, but there is no hurry about it because the tortoise is expected to live at least several more generations. It is not known how old he was when Capt. Cook took him on board at the Galapagos Islands as part of his ship's food supply.

Capt. Cook made the presentation a year before he discovered the Hawaiian Islands.

Science News Letter, January 8, 1955

PHYSICS

Aluminum Foil Used To Trap Cosmic Rays

➤ ALUMINUM FOIL such as used by housewives for cooking and storing foods can be used by scientists to trap the mysterious cosmic ray particles bombarding earth from somewhere in space.

Dr. W. W. Brown, a physicist at North American Aviation, Inc., Downey, Calif., has built an instrument for counting cosmic ray collisions, using aluminum foils of various thicknesses in a cloud chamber.

He described the apparatus and his results with it at the joint meeting of the American Physical Society and the American Association for the Advancement of Science in Berkeley, Calif.

The aluminum foils are mounted horizontally in a cloud chamber, forming the cathodes of the counting system. Thin tungsten wires strung between the pieces of foil form the anodes. The cloud chamber is filled with a gas, argon saturated with isoamyl alcohol, in which the cosmic rays colliding with atoms in the foils and in the gas leave their tracks.

The device was built by Dr. Brown when he was working at the University of California.

E FIELDS

BIOCHEMISTRY

Body Enzyme Effective Against Mice Cancers

AN ENZYME chemical found in many body fluids and having some anti-germ property can also check the growth of certain cancers in mice, Drs. Otto E. Lobstein and S. I. Dulkin of Chem-Tech Laboratories, Beverly Hills, Calif., reported to the American Association for the Advancement of Science meeting in Berkeley, Calif.

The enzyme, called lysozyme, was injected directly into the cancers. In many instances, the cancer regressed completely

after the injections.

Survival time of the mice was "significantly increased," the scientists reported, stating that "healing" in some of them was "complete."

Under the best conditions, however, only about half the mice with tumors were af-

fected by the enzyme chemical.

"Possibly a mixture of different enzymes may help in these instances, and is under investigation at the moment," the scientists said. "In the control group where no lysozyme was injected, all mice were eventually killed by tumors."

This work was suggested by a previous study of Dr. Lobstein's, showing that proved cancer patients had a statistically significant, higher blood lysozyme level than normal individuals. It was concluded that this lysozyme elevation may be one of the defense mechanisms by which bodies fight cancer.

Science News Letter, January 8, 1955

ICHTHYOLOGY

Light Barriers Keep Fish In Specified Channel

LIGHT BARRIERS may be the key to the unsolved problem of getting young salmon and steelhead trout safely down-

stream to salt water.

"The increased competition for water for electrical power, irrigation and industrial uses has resulted in a precarious condition of the salmon and steelhead fisheries," Paul E. Fields, Gary L. Finger and Ronald J. Adkins of the School of Fisheries at the University of Washington reported at meeting of the American Association for the Advancement of Science in Berkeley, Calif.

Each year, dams and polluted water have taken a high toll of the young migrants. A recent study showed that at Baker Dam, 250 feet high, 64% of the sockeye and 54% of the silver salmon passing over the spillway were killed, as were 34% of the sockeye and 28% of the silver salmon passing through the turbines.

The three Washington State scientists re-

ported that patterns of light were found to be a very important sensory stimuli for the fish. Light was used as a negative stimulus to repel and keep salmon out of certain areas, rather than to attract them.

Patterns of light were used in this manner successfully to guide more than 90% of the silver, chinook and sockeye migrants studied into a specified channel.

The laboratory results have to be validated, the biologists pointed out. However, the success to date makes it plausible that the proper application of light barriers may provide a partial answer for guiding migrant salmon.

Science News Letter, January 8, 1955

EDUCATION

Propose Criminalist as Specialist in Many Fields

➤ A NEW profession — criminalist — was introduced to scientists at the meeting of the American Association for the Advancement of Science in Berkeley, Calif.

A criminalist is a specialist, but not in any one scientific field. He must be qualified as an expert to identify any of a large number of different kinds of evidence from blood groups to ink, from textiles to metals, from vegetation to soils.

The qualifications of a criminalist and an outline of the kind of training he must have were described by Dr. Paul L. Kirk, professor of criminalistics at the University of California.

In a single case, Dr. Kirk told the meeting, five or six experts, had they been available, might have been called on to examine the evidence.

The case was a crime in which a young lady was kidnapped, assaulted and robbed. The significant evidence included blood which had to be typed and tested for syphilis since a suspect had this disease, hairs and fibers from both victim and suspect, dog hairs found on both and at the scene of the crime, vegetation found on the suspect along with broken glass, sand, concrete, wood fragments and other residues.

Police departments, Dr. Kirk pointed out, do not have such specialists available, nor the funds to hire them. A single well-trained criminalist is entirely competent to make all the identifications and, in addition, he understands the practical side of crime investigation and the legal requirements of courts with regard to evidence.

A criminalist, like a general physician, must begin his training with a broad knowledge, especially in science. The criminalist's course closely parallels that of a premedical student's, in fact.

On this, he must build with study of microscopy and microchemistry, and their application to microscopic evidence. He must study examination of crime scenes, laws of evidence, personal identification and the special instruments of the crime laboratory.

Altogether, the criminalist's training requires a minimum of five years of college

Science News Letter, January 8, 1955

RADIO ASTRONOMY

Reveal Plans to Build Large Radio Telescope

THE LARGEST saucer-like radio telescope in the United States, a giant "dish" 60 feet in diameter, will be built at the Agassiz Station of Harvard College Observatory.

The National Science Foundation is expected to help support its construction, scheduled to begin shortly. An anonymous benefactor will also contribute to the proposed new radio telescope, which will be a

steerable parabolic antenna.

To record and study the radio radiation being received on earth from outer space, large antennas and sensitive electronic recording instruments are required. The largest radio telescope of the saucer variety now in use, operated by the Naval Research Laboratory, is 50 feet in diameter.

Two larger antennas of the same kind are now being built abroad. The Dutch are constructing a 75-foot instrument, and the British are building a giant 250-foot antenna, scheduled for completion next year.

Radio astronomy, only about 20 years old as a science, has given astronomers a new "eye" with which to learn more about the sun, and the structure of the Milky Way galaxy of which the sun and its planets are

U. S. astronomers are also discussing the possibility of cooperating to build a large radio astronomy observatory from which radio waves could be bounced off Mars and other planets as well as the sun. (See SNL, July 31, 1954, p. 67.)

Science News Letter, January 8, 1955

MEDICIN

Trypsin Dissolves Clots in Hearts

➤ IN ANIMAL experiments, trypsin has been used to dissolve clots in vessels that feed blood to heart tissue, holding out hope that a similar chemical may do the same for human beings.

If so, it might help two heart conditions that are often fatal: damaged heart tissue resulting from the blocking of blood flow by the clot, and coronary shock that results from a sudden drop in blood pressure.

The study, carried out under the direction of Dr. Clarence Agress, was supported by grants from the U.S. Public Health Service and Los Angeles County Heart Association.

Although trypsin has been used to dissolve blood clots in other parts of the human body, its effectiveness in dissolving those in human heart blood vessels has not so far been demonstrated. An anti-enzyme in humans neutralizes the chemical before it acts on the clot, scientists believe.

However, the animal experiments give hope that some similar chemical may be found to be effective or that ways may be found to block the anti-enzyme action.

GEOLOGY

Rich Titanium Mine

One of richest deposits of titanium ore, or rutile, in the world has been discovered in Mexico. It will yield a new supply of this metal, so vital to modern industry.

See Front Cover

By WATSON DAVIS

▶ ONE OF the richest titanium deposits in the world, literally mountains of high grade rutile ore, is about to be tapped to give the United States a new supply of the strong, rustless, light metal for use in jet planes, rockets, air-borne equipment, armor and, eventually, in all fields of industry.

This new mine, discovered a little more than a year ago, lies near the primitive Mexican town of Pluma Hidalgo, Oaxaca, so remote because of transportation that it

takes about a day to reach it.

Development of the rutile deposit is being made by Republic Steel Corporation of Cleveland, headed by Charles M. White.

Already more than 25,000,000 tons of ore, expected to average at least 20% titanium dioxide, which is rutile, have been proved by digging into the mountain sides with exploratory tunnels, or adits. In one place, the rock actually runs 95% rutile.

The proved ore is a small part of the story, for Republic has filed 38 claims covering about 8,000 acres, seven miles in length, of precipitous mountain terrain.

Early Mesabi Days Recalled

For titanium, Mina Guadalupe de Tisur, the first to be worked, is reminiscent of the early days of the great Mesabi iron ore deposits of Minnesota. History may give it an equal place.

A small party of newspaper and magazine writers visited this new mine, and clambered over the ore bodies and the "up-and-down" site where a concentrating plant should be working a year from now, putting out 2,000 tons of concentrate, 95% rutile, each month.

We flew into Pochutla from Mexico City by special plane, landing on a small airstrip off which burros have to be chased each time the tri-weekly plane arrives.

From there, in a fleet of four jeeps, we visited the cluster of huts on the Pacific known as Puerto Angel, Port of the Angel, from which the titanium concentrate will eventually be shipped by water. No ships call there regularly, but coffee picking in this tropical area is in full swing and soon thousands of gigantic bags of green coffee will leave the small pier there for San Francisco by chartered ship.

Distance in this region is measured in hours, not miles. For the roads are impassable to anything but a jeep, sturdy truck, burro and by foot. The ruts, sur-

viving from the rainy season that ended a little more than a month ago, are deep and steep. One travels with a continual bounce.

It took over an hour to go to Puerto Angel from Pochutla, a matter of only a few miles. To reach Pluma and then Republic's mining camp on a mountain top required the rest of the daylight. We were about 26 miles from the sea and one day from Mexico City.

The plains near the Pacific are lush tropics. As the jeeps plunged into the mountains, winding upward, fording rushing streams, the vegetation changed somewhat, with parakeets screeching in the distance. Giant tree ferns showed lack of frost since the days of the dinosaurs.

Coffee Plantations Nearby

Soon the coffee trees, with fruits now becoming red, were seen covering the steep mountain sides, where they were planted several generations ago by German settlers, since dispossessed by the Mexican revolution. The titanium ore deposits lie beneath coffee plantations, or fincas as they are called.

Both coffee for the breakfast cups of America and the new metal, titanium, will be produced amicably from the same area.

From these mountain coffee "fineas" come 15,000 to 20,000 tons of coffee a year. Republic's titanium mine should produce in its first year a little more tonnage of concentrate, 24,000 tons. To this part of Oaxaca state, the new industry of titanium mining will add a new source of income giving 600 to 800 men work, the largest payroll in the state.

Credit for Discovery

To 82-year-old Donald Gillies, old-timer in Republic's mining enterprises, belongs the chief credit for discovering this great rutile deposit. With two other mining engineers, Prof. W. A. Seaman, retired from Michigan School of Mines, and Ward A. Broadfield, Gillies went into this area in Sept., 1953, and found the ore in places others had looked over and abandoned.

Today, Gillies outclimbs visitors along the 60-degree slopes and he is as surefooted as a burro.

Prof. Seaman is shown examining one section of the mine in the photograph on the cover of this week's Science News Letter. Native Indians are working around him.

Some ore has been produced in the exploratory digging, but there is no place to store it. There is no level ground. Within



DONALD GILLIES — Shown bere taking a sample from the recently discovered titanium mountain in Mexico, Gillies is credited as being the chief discoverer of the ore deposit.

a few weeks, crushing and concentrating machines will be ordered in the United States and shipped to Oaxaca, to be carried 122 miles over progressively worse roads to a plant site between the Rio Zaragosa and the Agua Pluma.

Before the next rainy season, the concentrators should be working and the enriched ore will start toward the United States. Roads will be improved and the mine will lose some of its remoteness.

Getting a concentrate is only the first step in producing titanium. Both rutile, or titanium oxide, and ilmenite, titanium iron oxide, will be produced, but more rutile than ilmenite. Rutile runs 60% titanium and ilmenite only 20%. What happened in the long stretches of geologic time is that nature changed ilmenite into rutile.

The concentrating plant will separate the two minerals. Most prized will be the rutile, reddish and showing crystal faces. It is the stuff of a new metallic age.

Snatching the oxygen from the titanium in rutile and producing the silvery elemental metal is an arduous process now, involving changing the titanium oxide to titanium tetrachloride and then reacting it with metallic magnesium without air to get spongy metal titanium.

Partial Processing in U. S.

This will be done for the present in the United States and Republic may not actually process the sponge. The process is expensive now. There is hope that it can be improved and made cheaper.

Titanium sponge is now \$4.50 per pound. Rolled into sheet for use in structures, it triples or quadruples in cost. The new source of ore and a new process could cut these costs in the future, giving the world a new practical metal. That is the hope of Republic's engineers and officials.

From the mine to the capital city of Oaxaca is a good ten hours. Truck or jeep must be used over the first 12 miles. It is 122 miles in all. Over the mountains, the rain forests disappear. The last coffee tree is seen. The fields lie sparse and dry. One is in another land.

Oaxaca may be as well known for the titanium that lies beyond it, as for the ancient ruins, Monte Alban and Mitla, built by the ancestors of the Zapotecs who till the fields, pick the coffee and who will work the mines.

The Indians, skilled, honest, faithful, hard-working, are partners in the newfound riches of their land, not just the rock drillers, the blacksmiths, the carpenters and the laborers.

Engineer Francisco De La Pena surveys the land. Engineer Ramon Garcia is mine superintendent.

As for Pedro Vara, there is no better jeep driver in all the world.

Science News Letter, January 8, 1955

The flightless kiwi of New Zealand lays an egg that is one-fourth its own weight.

NATURAL RESOURCES

Water Shortage Solution

A PROGRAM to cope with the increasing demands for water in the United States was proposed by Carl G. Paulsen, chief hydraulic engineer for the U. S. Geological Survey, to the American Association for the Advancement of Science meeting in Berkeley, Calif.

Mr. Paulsen pointed out that although the United States is blessed with a plentiful water supply, consumption has risen fourfold from 1900 to 1950, and that it is expected to double again by 1975.

He presented the following proposals to stretch the water supply for the growing needs of the future:

1. Use of low quality water, perhaps even ocean water in some industries.

2. Reduction of evaporation losses by building reservoirs deep rather than wide and placing them in areas of low evapo-

3. Cutting down pollution of streams by industrial wastes and also reuse of water in some factories.

4. Possible conversion of sea water to drinking water and possible seeding of clouds to change precipitation patterns.

Although there is a lot of water in the United States, he said, many areas have shortages. Household appliances such as

air conditioners and washers are taking up great quantities of water, and the many new electrical devices have increased the consumption of water by power plants.

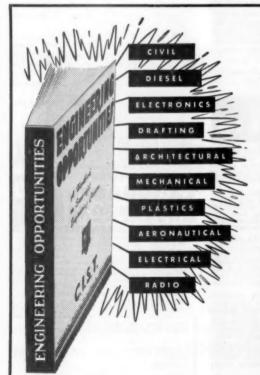
In addition, industry is using more and more water in the manufacture of nylon, synthetic rubber, oil products and other products. Not only do these plants use water directly, but they also pollute streams, making them undesirable as water sources.

Cloud seeding and making fresh water from the ocean are both under study. The ion-permeable membrane system for salt water conversion might be the answer to the needs of some areas, he said.

He outlined methods to prevent salt water from ruining some of the underground water sources. Included are plugging unused wells and halting the salt water with a fresh water barrier.

Another possible answer to the water problem in some areas may be to remove some of the phreatophytes, or water-loving plants, which consume great masses of underground reserves. In 15,000,000 acres of 17 western states, these plants suck up a volume of water estimated to be equal to twice the average annual flow of the Colorado River at Lees Ferry.

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Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

CHARLES DARWIN AND THE GOLDEN RULE-William Emerson Ritter, compiled and edited by Edna Watson Bailey-Science Service-Storm, 400 p., illus., \$5.00. The late Dr. Ritter was an eminent naturalist who pondered long and earnestly about the affairs of that outstanding animal, man. This book constitutes a summary of Dr. Ritter's philosophy, in part an outgrowth of his admiration for the great Darwin.

COMPARATIVE POPULATION AND URBAN RE-SEARCH VIA MULTIPLE REGRESSION AND COVAR-IANCE ANALYSIS: A Methodological Experiment, With an Illustrative Application to the Study of Factors in the Growth and Suburbanization of Metropolitan Population-Donald J. Bogue and Dorothy L. Harris-Scripps Foundation for Research in Population Problems-Population Research and Training Center, University of Chicago, Studies in Population Distribution Number 8, 75 p., illus., paper, 90 cents.

THE EARTH AS A PLANET-Gerard P. Kuiper-University of Chicago Press, 751 p., illus., \$12.50. The second of a series of four volumes intended to collect and systematize all information available on the solar system. The first volume was on the sun.

HANDBOOK OF TREATMENT-Harold Thomas Hyman-Lippincott, 511 p., \$8.00. For quick reference by general practitioners.

OPERATIONS RESEARCH FOR MANAGEMENT-Joseph F. McCloskey and Florence N. Trefethen, Eds., with introduction by Ellis A. Johnson-Johns Hopkins Press, 409 p., illus., \$7.50. An outgrowth of a seminar for the training of new operations analysts joining the Operations Research Office. Although operations research employs highly developed and powerful mathematical tools, it is pointed out, the concepts used are vastly more significant.

RECENT DEVELOPMENTS IN CELL PHYSIOLOGY: Proceedings of the Seventh Symposium of the Colston Research Society held in the University of Bristol, March 29th—April 1st, 1954—J. A. Kitching, Ed.—Academic, 206 p., illus., \$6.50. Papers in a field that is common ground for botanist and zoologist, biochemist and biophysicist, geneticist and embryologist.

6-MERCAPTOPURINE - George H. Hitchings and C. P. Rhoads, Conference Co-Chairmen-New York Academy of Sciences, 326 p., illus., paper, \$4.50. Reporting studies of the use of this new antimetabolite as a tumor inhibitor and in treatment of acute leukemia.

THE Sources OF EDDINGTON'S PHILOSOPHY-Herbert Dingle—Cambridge University Press, 64 p., paper, 75 cents. The eighth of a series of lectures intended as a memorial to the late Sir Arthur Eddington.

SPONSORED RESEARCH POLICY OF COLLEGES AND UNIVERSITIES-Committee on Institutional Research Policy-American Council on Education, 93 p., \$1.50. An evaluation of the prob-lems raised by research supported by government, industry or by foundations.

STRAY FEATHERS FROM A BIRD MAN'S DESK-Austin L. Rand—Doubleday, 224 p., illus., \$3.75. A collection of odd facts about birds, such as that some birds use tools and some cosmetics, one male bird walls his mate in the nest during breeding season, some birds hibernate, and so on.

TITANIUM AND TITANIUM ALLOYS-John L. Everhart-Reinhold, A Reinhold Pilot Book, 184 p., illus., \$3.00. Intended for the engineer or designer interested in the use of this metal to solve his own problems.

THE TREASURY OF SCIENCE FICTION CLASSICS -Harold W. Kuebler, Ed.-Hanover House, 694 p., \$2.95. This collection of classics from the pens of such writers as Edgar Allan Poe, H. G. Wells, Conan Doyle and J. B. Priestley shows that science fiction is no new thing born of the atomic age.

Science News Letter, January 8, 1955

MORE GOLF SECRETS

BY H. A. MURRAY, M.D., author of The Golf Secret. The discoverer of the simple "left-shoulder method" that quickly helped thousands to power and accuracy in the golf swing, has just written a new book, MORE GOLF SECRETS.

GOLF SECRETS.

Contrary to much golf instruction, this expert believes in playing golf the easy way—that is, "GETTING WITH" (NOT FIGHTING AGAINST)—the body's structure and dynamics. A medical doctor, he knows intimately the anatomy and body mechanics of which he writes.

namics. A medical doctor, he known intimately the anatomy and body mechanics of which he writes.

Here are invaluable advice and information on all aspects of the game other than the swing (which was dealt with in "The Golf Eccret"). The same bed-rock good sense, keen observation, analytical insight, and onthe-spot understanding of what-to-do (and what-to-avoid!) make this another priceless short cut to low-score golf.

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Close up

You are leading a troop of scouts on a hike through the deep woods, and the youngest of them spots a strange reddish blotch on the trunk of an old hemlock. Is it an old paint dab or a new fungal blight? Jot it down on Kodachrome Film for checking.

You are studying the allergenic properties of various substances and don't want to depend on verbal descriptions of your observations. Jot them down on Kodachrome Film.

You are investigating erratic behavior of an extrusion press and discover an alarming crack on the hidden side of the base casting. Jot it down on film so that the manufacturer will know exactly what you are talking about.

"Jot it down" brings a wistful little smile to the lips of those who recognize in that pat term a wee oversimplification of certain problems in lighting, focusing, framing, and camera support that they have encountered in such situations. These skeptics we now confound with this device:



We are not going to suggest that you knock such a simple instrument together yourself because a) you probably won't get around to it and will therefore miss out on a good idea for broadening the usefulness of photography in your activities; b) if you did make it a

project, you'd find it takes π times as many hours as you had figured on and then you would discover the first time out that there was an important design point you had overlooked.

Instead we suggest a visit to your Kodak dealer for a look at the new Kodak Technical Close-Up Outfit. Heft of it. Note that all you do is put it up to your subject, squeeze, and you get a picture of whatever ear of wheat, aneurysm, or lump of carnotite is in the rectangle. (To avoid distracting shadows, two of its sides have been omitted but your eye easily imagines them. The two sides that are there are just out of the picture.)

The light comes from a walnutsized flash bulb inside the bag. Since that close it overwhelms even sunlight, exposure, like focus and composition, requires no decision, no onerous cerebration. This always augurs well for the non-professional in photography who nonetheless appreciates good photographs. To use the outfit at 3 feet or at 15 feet or with black-and-white film demands but one or two procedure changes, unambiguously stated on the flash holder. The outfit includes the excellent Kodak Pony 828 Camera, the Kodak B-C Flasholder, and several other items better seen than read about. The camera is also yours to use without the hardware, of course.

You press the button; it does the rest. \$62.75.

Potassium trap

The ominously nitro-begirt aspect of this molecule should not be allowed to divert attention from its useful and unusual ability to precipitate potassium selectively from solution. Its "trivial" name of dipicrylamine suggests a sensitive nature like that of picric acid and the even more sensitive ammonium salt of that acid. Dipicrylamine may not be quite so ready to yield up its potential energy with violent rapidity. All the same, our man who prepares it by further nitrating dinitrodiphenylamine (and anyone who uses it) is well advised to keep his mind on his work. When he has finished purifying it to analytical grade, he labels it 2,2',4,4',6,6'-Hexanitrodiphenylamine and numbers it Eastman 4402.

All this is brought to mind by a recent editorial in a British industrial magazine, captioned "Winning potash from the sea." It is about the use of this very compound on a large industrial scale. The calcium salt is added to sea water in an amount almost equivalent to the potassium content of the water. Potassium dipicrylaminate is thereby precipitated and then treated with acid to liberate the dipicrylamine for reuse.

Such a process hardly needs the purity that brings the price of Eastman 4402 up to \$1.75 for 10 grams, but the editorial set us to wondering whether all the biologists and physiologists interested in the potassium balance of life know it is that easy to pick out potassium ions at will.

There is an abstract we give away on gravimetric, acidimetric, and colorimetric procedures with this reagent in the determination of potassium. We also give away our Eastman Organic Chemicals List No. 39 to those who want a handy source for some 3500 highly purified organics. For either abstract or catalog, write to Distillation Products Industries, Eastman Organic Chemicals Department, Rochester 3, N. Y. (Division of Eastman Kodak Company).

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Egret

COVERING THE southern tip of Florida is a watery, mangrove-choked waste land now a U. S. national park.

To the Everglades, visitors from the frozen north will throng by the thousands this winter. They will come to see, not majestic mountains or towering waterfalls, but strange plants and beautiful birds.

The southern Everglades swarms with bird life, and naturally a great many of the birds are those which frequent water or the water's edge. In the Everglades there is a lot of water. Of all the tropical swimming or wading birds there, none are more beautiful than the herons, and of the herons none is more lovely than the egret.

This snowy bird is not so large as some of his cousins. It is a good-sized fowl, standing about two feet from beak to stern, but it is dwarfed in size by other herons or "cranes" which tower on spindly legs and soar on wide-stretched wings.

To ornithologists the true egret is "Egretta candidissima"—the whitest egret. He has a taller relative, with a few colored feathers. Both birds bear, during the nesting season, the delicate plumes once used in vast quantities to adorn milady's feathered hat.

Hunting these "aigrettes" threatened the very existence of birds which grew in quiet glory before man came. Even today, poaching is a considerable menace, although there are protective laws practically everywhere the egret might fly. These are well enforced, thanks to public sentiment and the National Audubon Society. Today there are egret colonies even in populated areas, near cities and tourist routes.

There is no reason why the North should not have its colonies of egrets as well as the South. The birds once nested as far north as Indiana. They retreated to their present restricted range, from North Carolina south and west to Louisiana, partly because too many human inhabitants moved into their homelands, and partly because fashionable ladies demanded feathers of brilliant hues for their vanity.



New Machines and Gadgets

For sources of more information on new things described, send a self-addressed stamped envelope to SCIENCE NEWS LETTER, 1719 N St., N.W., Washington 6, D. C., and ask for Gadage Bulletin 760. To receive this Gadage Bulletin without special request each week, remit \$1.50 for one year's subscription.

the COLORED CUTOUTS of space rockets, Mother Goose or circus figures offer children a chance to make their own mobiles that whirl constantly in mid-air. The figures, made of sheet plastic, are assembled by tying them together with light thread.

Science News Letter, January 8, 1955

B DRY-FLY SPRAY keeps a lure floating atop the water, cast after cast, and leaves no oily ring to warn the wary fish. Contained in a push-button dispenser, the spray sets so quickly that after one back cast, the fly is dry.

Science News Letter, January 8, 1955

CRIB ROCKER gently joggles the baby to sleep and then shuts off automatically at a pre-set time. Placed on the floor, it can be attached to the back, front or either side of the crib. Holders keep the rocker from moving and the rocking motion can be shortened or lengthened by moving the rocker closer or farther from the crib.

Science News Letter, January 8, 1955

EXPOSURE METER is a direct reading type, which weighs less than two ounces and has no dials or tables. Pointed at the camera position, the f stop for perject exposure is read directly. Scale is also calibrated for Polaroid camera settings.

Science News Letter, January 8, 1955

1CE-FISHING HEATER keeps ice, snow and slush from forming around winter fishing holes. The heater is small enough to be carried in a coat pocket. It can also be used as a minnow-bucket heater, hand warmer or for heating a can of soup or pot of coffee.

Science News Letter, January 8, 1955

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B PLASTIC CAPS for the sportsman and racing car enthusiast are made from shatterproof, weather-resistant plastic, as shown in the photograph. Lightweight, this brightly colored headgear has a floating headband, an adjustable chin strap and, for extra protection against exposure, can have attached to it either a safari cape or longer cape.

Science News Letter, January 8, 1955

ALUMINUM DOUBLE-HUNG window requires no painting, and will not rust, warp or stick. Complete insulation is provided by flexible stainless steel and hollow rubber weatherstripping. Window can be field putty glazed or pre-glazed.

Science News Letter, January 8, 1955

SIMPLE DRAWINGS become threedimensional miniature plastic objects when exposed to heat from an ordinary light bulb. A make-them-at-home kit contains all the tools and a supply of what is described as the "magic plastic with a memory." Science News Letter, January 8, 1955

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BIOCHEMISTRY-What enzyme chemical can check cancer growth in mice? p. 25.

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MEDICINE—What is recommended way of treating stingray injuries? p. 20.

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POPULATION - How have fears of world starvation been eased? p. 21.

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PSYCHOLOGY-Why should those who have attempted suicide be watched closely? p. 20.

RADIO ASTRONOMY-What is the diameter of the largest radio telescope now being built? 0 0 0

Photographs: Cover and p. 26, Juan Guzman; p. 19, Fremont Davis; p. 23, Northrop Aircraft, Inc.; p. 31, Eastman Chemical Products,

Do You Know?

Centuries ago asbestos was used to make handkerchiefs which were laundered in fire.

Adding one-tenth of an ounce of copper sulfate to every thousand gallons of water is effective in getting rid of algae in pools.

The candlefish, or eulachon, of America's north Pacific coast is prized by Indians as food and for its oil; when the fish dried and a wick is pulled through it, it will burn like a candle.

Current world-wide production of uranium ore is estimated at 10,000 tons.

The greater the variety of trees, shrubs and vines in a woodlot, the greater its value as a home for wildlife.

Asbestos fiber, which is hard enough to resist a steel knife, can be scraped from certain rocks with a fingernail and fluffed into a soft fleece.

The falcon cuts its meat with a sharp protrusion and a notch on its beak.

There are nearly 58,000,000 motor ve-icles in use in the United States, and it is estimated that the number will climb to over 80,000,000 by 1965.

Whooping cough kills more children under two years of age than any other acute infection except diarrhea and pneumonia and, although the whooping cough death rate is falling, the toll is about equal to that of measles, scarlet fever and diphtheria combined.

Most of the uranium ore for the Communist world, about 1,000 tons, is mined in Russia, while smaller amounts come from Czechoslovakia, East Germany, Bulgaria and China.



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WAGNER

Die Meistersinger, Prelude, Act 1, Zurich Tonballe Orch., Otto Ackermann, Conducting

DUKAS